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Imported sparganosis in Canada

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Summary: The first case of human sparganosis in Canada is reported in a 23-year-old woman who emigrated from Greece in 1969. Examination of a ribbon-like worm removed from a painful swelling in the neighbourhood of her right biceps muscle revealed a single larva, about 110 mm. long and 2.5 mm. wide, subsequently identified as the plerocercoid larva or sparganum of a member of the genus *Spirometra.* The source of this infection, acquired in Greece, may have been undercooked pork.

Sparganosis, an uncommon infection of man, is caused by the sparganum or plerocercoid larva of pseudophyllidean cestodes of the genus *Spirometra.* Theoretically, man may acquire sparganosis by three mechanisms involving ingestion or inoculation of the procercoid larva or the plerocercoid (sparganum) larva: (1) by ingesting water containing *Cyclops* infected with procercoid larvae — the most likely mechanism in North America; (2) by ingesting raw or insufficiently cooked flesh of frogs, snakes, poultry or mammals infected by plerocercoid larvae — merely handling infected meat can produce human infection; and (3) by inoculation of spargana in the exotic oriental custom of applying split, live frogs and flesh of infected vertebrates as dressings or poultices to sores of the skin, conjunctiva or vagina, which allows direct migration of spargana into the sores.

Since 1908, when Stiles reported the first human case of sparganosis in North America,[1] 34 clinical and subclinical infections have been reported[2, 3] and a further 15 have been recorded but not reported[4] — a total of 49 sparganum infections in the United States. The mature tapeworm, *Spirometra mansonoides,* resembles *Diphyllobothrium latum.* The definitive hosts are dogs, cats and wild carnivora. The primary intermediate hosts are species of *Cyclops,* and the secondary intermediate hosts include small rodents, snakes, frogs and occasionally man.

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Case report

This 23-year-old woman of Lakkopetra, some 200 km. from Athens, Greece, first noticed swelling of her arm early in 1968, when her Greek physician diagnosed a lipoma and advised no treatment. In January 1969 she emigrated to Canada. When examined in July 1971 she had a soft, slightly raised, tender, subcutaneous swelling, measuring about 3.0 x 3.0 cm., lateral to the biceps tendon and proximal to the antecubital fossa of her right arm. The provisional diagnosis was lipoma.

Preoperative laboratory findings included: hemoglobin, 14.9 g./100 ml.; leukocytes, 10,300/c. mm. (polymorphs 57%, lymphocytes 34%, monocytes 6%, eosinophils 2%, basophils 1%); platelets, 273,000/c. mm.; erythrocyte sedimentation rate, 3 mm. in 1 hour; stool examination, no parasites seen.

At operation in August 1971 the subcutaneous tissue was explored through a transverse incision over the lower part of the right biceps muscle. No lipoma was detected. Beneath the lateral edge of the biceps muscle lay a white structure surrounded by connective tissue. By gentle traction, a worm about 8 inches long was extracted, intact, alive and wriggling. The worm tract, surrounded by reaction and edema, extended along the edge of the biceps muscle toward the shoulder. Through several transverse incisions the tract, along with surrounding muscle, was excised completely. The pathologist reported chronic inflammatory reaction of striated muscle and connective tissue surrounding a parasitic worm resembling a sparganum.

The ribbon-like, formalin-fixed larva measured 110 mm. long and

2.5 mm. wide, and was pseudosegmented. The fleshy anterior end was notched while the posterior end was narrowed (Fig. 1). When compressed between two slides and examined stereoscopically, the larva was devoid of organ systems, except for opaque, longitudinal excretory canals in its lateral margins. The muscular and fibrovascular connective tissue adjacent to the larva was infiltrated with lymphocytes, histiocytes, a few polymorphonuclear leukocytes and occasional eosinophils. Parts of the tissue were calcified. In size and form the larva resembled a sparganum. Since specific identification depends upon the morphological features of the mature tapeworm, no specific title can be given to a sparganum without complex feeding tests in which the live sparganum is fed to an appropriate definitive host, such as the cat, and subsequently recovered in its mature form for identification.

Discussion

This patient acquired her infection in Greece some three and one-half years before operation. She denied drinking untreated water from ponds, rivers or wells and eating undercooked frog or game-bird meat. She did, however, have a liking for pork, a possible source of infection. Pigs are naturally infected with plerocercoids. Bearup reported spargana in the muscle of Australian pigs.[5] Corkum established experimental sparganosis in pigs by feeding them larvae and subsequently recovering larvae from the peritoneum or the abdominal and thoracic musculature.[6] In most human sparganosis, infection is by a single sparganum located either in the superficial muscles or subcutaneously.[3] Usually the lesion is painless, recurrent and migratory; it may therefore be overlooked. Careful examination of biopsy material has revealed several zoonotic parasites previously unknown in Canada[7-9] Rarely, sparganosis affects the conjunctiva or glandular organs.

In the United States, animal surveys have revealed the possibility of autochthonous human sparganosis. In southern, central and eastern United States, mature tapeworms are widely distributed in cats, racoons, black and silver foxes and bobcats, while spargana are common in opossums, frogs and water snakes.[6,10,11] Whereas animals commonly become infected by ingesting procercoid larvae in infected copepods, man sometimes acquires infection by other mechanisms such as ingestion of meat containing spargana.[6,12,13] To date, neither enzootic nor human sparganosis has been found in Canada, but no substantial animal surveys have yet been undertaken. Such surveys, especially in parts of Canada bordering the enzootic regions in northeastern United States, might reveal the parasite in Canada, as suggested by Mueller.[2]

Résumé

Un cas de sparganose importé au Canada

Le premier cas de sparganose humaine rapporté au Canada affectait une femme de 23 ans qui avait émigré de Grèce en 1969. Elle présentait un gonflement douloureux dans le voisinage du biceps droit. On retira un ver en forme de ruban long de 110 mm et large de 2.5 mm, dont l'examen révéla qu'il s'agissait d'une larve plérocercoïde ou d'un sparganum d'un membre de l'espèce *Spirometra*. L'origine de cette infection, acquise en Grèce, peut avoir été de la viande de porc insuffisamment cuite.

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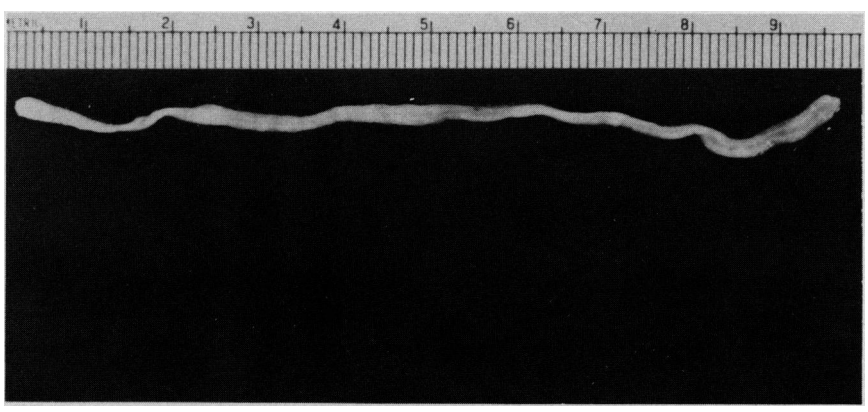

FIG. 1—Formalin-fixed intact sparganum; note the fleshy anterior end (left).